Epsylon Sp. z o.o. Sp. Komandytowa

eterio 220 RA1 (Intel Xeon Silver 4114, 2.20 GHz)

SPECrate2017_fp_base = 101
SPECrate2017_fp_peak = 102

### Hardware

**CPU Name:** Intel Xeon Silver 4114  
**Max MHz.:** 3000  
**Nominal:** 2200  
**Enabled:** 20 cores, 2 chips, 2 threads/core  
**Orderable:** 1.2 chips  
**Cache L1:** 32 KB I + 32 KB D on chip per core  
**L2:** 1 MB I+D on chip per core  
**L3:** 13.75 MB I+D on chip per chip  
**Other:** None  
**Memory:** 384 GB (24 x 16 GB 1Rx4 PC4-2666V-R, running at 2400)  
**Storage:** 1 x 960 GB SSD SATA III  
**Other:** None

### Software

**OS:** Red Hat Enterprise Linux Server release 7.4  
(Maipo)  
**Compiler:** C/C++: Version 18.0.0.128 of Intel C/C++ Compiler for Linux; Fortran: Version 18.0.0.128 of Intel Fortran Compiler for Linux  
**Parallel:** No  
**Firmware:** Version BIOS R0015 released Nov-2018  
**File System:** ext4  
**System State:** Run level 3 (multi-user)  
**Base Pointers:** 64-bit  
**Peak Pointers:** 64-bit  
**Other:** None
SPEC CPU2017 Floating Point Rate Result

Epsylon Sp. z o.o. Sp. Komandytowa

Eterio 220 RA1 (Intel Xeon Silver 4114, 2.20 GHz)

SPECrate2017_fp_base = 101
SPECrate2017_fp_peak = 102

CPU2017 License: 9081
Test Sponsor: Epsylon Sp. z o.o. Sp. Komandytowa
Tested by: Epsylon Sp. z o.o. Sp. Komandytowa

Test Date: Jan-2019
Hardware Availability: Sep-2017
Software Availability: Mar-2018

Results Table

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</table>

Submit Notes

The numactl mechanism was used to bind copies to processors. The config file option 'submit' was used to generate numactl commands to bind each copy to a specific processor.

For details, please see the config file.

Operating System Notes

Stack size set to unlimited using "ulimit -s unlimited"

General Notes

Environment variables set by runcpu before the start of the run:
LD_LIBRARY_PATH = "/cpu2017.1.0/lib/ia32:/cpu2017.1.0/lib/intel64:/cpu2017.1.0/jem5.0.1-32:/cpu2017.1.0/jem5.0.1-64"

Binaries compiled on a system with 1x Intel Core i7-4790 CPU + 32 GB RAM memory using Redhat Enterprise Linux 7.4

Yes: The test sponsor attests, as of date of publication, that CVE-2017-5754 (Meltdown) is mitigated in the system as tested and documented.
Yes: The test sponsor attests, as of date of publication, that CVE-2017-5753 (Spectre variant 1) is mitigated in the system as tested and documented.
Yes: The test sponsor attests, as of date of publication, that CVE-2017-5715 (Spectre variant 2) is mitigated in the system as tested and documented.
Epsylon Sp. z o.o. Sp. Komandytowa

tetio 220 RA1 (Intel Xeon Silver 4114, 2.20 GHz)

SPECrate2017_fp_base = 101
SPECrate2017_fp_peak = 102

CPU2017 License: 9081
Test Sponsor: Epsylon Sp. z o.o. Sp. Komandytowa
Test Date: Jan-2019
Tested by: Epsylon Sp. z o.o. Sp. Komandytowa
Hardware Availability: Sep-2017
Software Availability: Mar-2018

General Notes (Continued)

Transparent Huge Pages enabled by default
Prior to runcpu invocation
Filesystem page cache synced and cleared with:
sync; echo 3>/proc/sys/vm/drop_caches
runcpu command invoked through numactl i.e.:
numactl --interleave=all runcpu <etc>

Platform Notes

BIOS Settings:
Intel(R) Hyper-Threading Tech = Enabled
CPU Power and Performance Policy = Performance
Intel(R) Turbo Boost Technology = Enabled
C1E = Disabled
Processor C6 = Disabled
IMC Interleaving = Auto
Sub_NUMA Cluster = Disabled
Set FAN Profile = Performance
Patrol Scrub = Disabled

Sysinfo program /cpu2017.1.0/bin/sysinfo
Rev: r5797 of 2017-06-14 96c45e4568ad54c135fd618b091c0f
running on SUT Thu Jan 31 01:16:35 2019

SUT (System Under Test) info as seen by some common utilities.
For more information on this section, see
https://www.spec.org/cpu2017/Docs/config.html#sysinfo

From /proc/cpuinfo

model name : Intel(R) Xeon(R) Silver 4114 CPU @ 2.20GHz
2 "physical id"s (chips)
40 "processors"
cores, siblings (Caution: counting these is hw and system dependent. The following
excerpts from /proc/cpuinfo might not be reliable. Use with caution.)
cpu cores : 10
siblings : 20
physical 0: cores 0 1 2 3 4 8 9 10 11 12
physical 1: cores 0 1 2 3 4 8 9 10 11 12

From lscpu:
Architecture: x86_64
CPU op-mode(s): 32-bit, 64-bit
Byte Order: Little Endian
CPU(s): 40
On-line CPU(s) list: 0-39

(Continued on next page)
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**SPECCPU2017 License:** 9081
**Test Sponsor:** Epsylon Sp. z o.o. Sp. Komandytowa
**Tested by:** Epsylon Sp. z o.o. Sp. Komandytowa
**Hardware Availability:** Sep-2017
**Software Availability:** Mar-2018
**Test Date:** Jan-2019

---

**Platform Notes (Continued)**

- **Thread(s) per core:** 2
- **Core(s) per socket:** 10
- **Socket(s):** 2
- **NUMA node(s):** 2
- **Vendor ID:** GenuineIntel
- **CPU family:** 6
- **Model:** 85
- **Model name:** Intel(R) Xeon(R) Silver 4114 CPU @ 2.20GHz
- **Stepping:** 4
- **CPU MHz:** 1373.539
- **CPU max MHz:** 3000.0000
- **CPU min MHz:** 800.0000
- **BogoMIPS:** 4400.00
- **Virtualization:** VT-x
- **L1d cache:** 32K
- **L1i cache:** 32K
- **L2 cache:** 1024K
- **L3 cache:** 14080K
- **NUMA node0 CPU(s):** 0-9,20-29
- **NUMA node1 CPU(s):** 10-19,30-39
- **Flags:** fpu vme de pse tsc msr pae mce cx8 apic sep mtrr pge mca cmov pat pse36 clflush dts acpi mmx fxsr sse sse2 ss ht tm pbe syscall nx pdpe1gb rdtscp lm constant_tsc art arch_perfmon pebs bts rep_good nopl xtopology nonstop_tsc aperfmperf eagerfpu pni pclmulqdq dtes64 monitor ds_cpl vmx smx est tm2 ssse3 fma cx16 xtrm pclrid cca sse4_1 sse4_2 x2apic movbe popcnt tsc_deadline_timer aes xsave avx f16c rdrand lahf_lm abm 3dnowprefetch epb cat_l3 cdp_l3 invpcid_single intel_pt spec_ctrl ibpb_support tpr_shadow vnmi flexpriority ept vpid fsgsbase tsc_adjust bmi1 hle avx2 smep bmi2 erms invpcid rtm cqm mpx rdt_a avx512f avx512dq rdseed adx smap clflushopt clwb avx512cd avx512bw avx512vl xsaveopt xsavec xgetbv1 cqm_llc cqm_occup_llc cqm_mbm_total cqm_mbm_local dtherm ida arat pln pts hwp hwp_act_window hwp_epp hwp_pkg_req

/proc/cpuinfo cache data

```
cache size : 14080 KB
```

From `numactl --hardware` WARNING: a numactl 'node' might or might not correspond to a physical chip.

```
available: 2 nodes (0-1)
node 0 cpus: 0 1 2 3 4 5 6 7 8 9 20 21 22 23 24 25 26 27 28 29
node 0 size: 195270 MB
node 0 free: 190407 MB
node 1 cpus: 10 11 12 13 14 15 16 17 18 19 30 31 32 33 34 35 36 37 38 39
node 1 size: 196608 MB
node 1 free: 191870 MB
node distances:
node   0   1
0:  10  21
```

(Continued on next page)
**SPEC CPU2017 Floating Point Rate Result**

**Epsylon Sp. z o.o. Sp. Komandytowa**

**etrio 220 RA1 (Intel Xeon Silver 4114, 2.20 GHz)**

**SPECrate2017_fp_base = 101**
**SPECrate2017_fp_peak = 102**

---

**CPU2017 License:** 9081

**Test Sponsor:** Epsylon Sp. z o.o. Sp. Komandytowa

**Test Date:** Jan-2019

**Hardware Availability:** Sep-2017

**Tested by:** Epsylon Sp. z o.o. Sp. Komandytowa

**Software Availability:** Mar-2018

---

**Platform Notes (Continued)**

```
1:  21  10
```

From /proc/meminfo

MemTotal: 394680272 kB
HugePages_Total: 0
Hugepagesize: 2048 kB

From /etc/*release* /etc/*version*

os-release:
NAME="Red Hat Enterprise Linux Server"
VERSION="7.4 (Maipo)"
ID="rhel"
ID_LIKE="fedora"
VARIANT="Server"
VARIANT_ID="server"
VERSION_ID="7.4"
PRETTY_NAME="Red Hat Enterprise Linux"
redhat-release: Red Hat Enterprise Linux Server release 7.4 (Maipo)
system-release: Red Hat Enterprise Linux Server release 7.4 (Maipo)
system-release-cpe: cpe:/o:redhat:enterprise_linux:7.4:ga:server

uname -a:
Linux SUT 3.10.0-693.21.1.el7.x86_64 #1 SMP Fri Feb 23 18:54:16 UTC 2018 x86_64 x86_64 x86_64 GNU/Linux

run-level 3 Jan 30 14:23

SPEC is set to: /cpu2017.1.0

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<tr>
<th>Filesystem</th>
<th>Type</th>
<th>Size</th>
<th>Used</th>
<th>Avail</th>
<th>Use%</th>
<th>Mounted on</th>
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<td>ext4</td>
<td>825G</td>
<td>94G</td>
<td>690G</td>
<td>12%</td>
<td>/</td>
</tr>
</tbody>
</table>

Additional information from dmidecode follows. WARNING: Use caution when you interpret this section. The 'dmidecode' program reads system data which is "intended to allow hardware to be accurately determined", but the intent may not be met, as there are frequent changes to hardware, firmware, and the "DMTF SMBIOS" standard.

BIOS Intel Corporation SE5C620.86B.00.01.0015.110720180833 11/07/2018
Memory:
24x Samsung M393A2K40CB2-CTD 16 GB 1 rank 2666, configured at 2400

(End of data from sysinfo program)

---

**Compiler Version Notes**

```
==============================================================================
CC  519.lbm_r(base) 538.imagick_r(base, peak) 544.nab_r(base)
==============================================================================
```

(Continued on next page)
Epsylon Sp. z o.o. Sp. Komandytowa
eterio 220 RA1 (Intel Xeon Silver 4114, 2.20 GHz)

SPEC CPU2017 Floating Point Rate Result

Copyright 2017-2019 Standard Performance Evaluation Corporation

Epsylon Sp. z o.o. Sp. Komandytowa
eterio 220 RA1 (Intel Xeon Silver 4114, 2.20 GHz)

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Hardware Availability: Sep-2017
Tested by: Epsylon Sp. z o.o. Sp. Komandytowa
Software Availability: Mar-2018

Compiler Version Notes (Continued)

icc (ICC) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation. All rights reserved.

==============================================================================
CC  519.lbm_r(peak) 544.nab_r(peak)
==============================================================================
icc (ICC) 18.0.0 20170811
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iccc (ICC) 18.0.0 20170811
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==============================================================================
FC  507.cactuBSSN_r(base)
==============================================================================
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(Continued on next page)
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Compiler Version Notes (Continued)

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ifort (IFORT) 18.0.0 20170811
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----------------------------------------------------------------------------------

FC 507.cactuBSSN_r(peak)
----------------------------------------------------------------------------------

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----------------------------------------------------------------------------------

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----------------------------------------------------------------------------------

CC 554.roms_r(peak)
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----------------------------------------------------------------------------------

CC 521.wrf_r(base) 527.cam4_r(base)
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CC 521.wrf_r(peak) 527.cam4_r(peak)
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(Continued on next page)
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Hardware Availability: Sep-2017
Software Availability: Mar-2018

Compiler Version Notes (Continued)
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Base Compiler Invocation

C benchmarks:
icc

C++ benchmarks:
icpc

Fortran benchmarks:
ifort

Benchmarks using both Fortran and C:
ifort icc

Benchmarks using both C and C++:
icpc icc

Benchmarks using Fortran, C, and C++:
icpc icc ifort

Base Portability Flags

503.bwaves_r: -DSPEC_LP64
507.cactuBSSN_r: -DSPEC_LP64
508.namd_r: -DSPEC_LP64
510.parest_r: -DSPEC_LP64
511.povray_r: -DSPEC_LP64
519.lbm_r: -DSPEC_LP64
521.wrf_r: -DSPEC_LP64 -DSPEC_CASE_FLAG -convert big_endian
526.blender_r: -DSPEC_LP64 -DSPEC_LINUX -funsigned-char
527.cam4_r: -DSPEC_LP64 -DSPEC_CASE_FLAG
538.imagick_r: -DSPEC_LP64
544.nab_r: -DSPEC_LP64
549.fotonik3d_r: -DSPEC_LP64
554.roms_r: -DSPEC_LP64
**SPEC CPU2017 Floating Point Rate Result**

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---

**Base Optimization Flags**

C benchmarks:
- -xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-prefetch
- -ffinite-math-only -qopt-mem-layout-trans=3

C++ benchmarks:
- -xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-prefetch
- -ffinite-math-only -qopt-mem-layout-trans=3

Fortran benchmarks:
- -xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-prefetch
- -ffinite-math-only -qopt-mem-layout-trans=3 -nostandard-realloc-lhs
- -align array32byte

Benchmarks using both Fortran and C:
- -xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-prefetch
- -ffinite-math-only -qopt-mem-layout-trans=3 -nostandard-realloc-lhs
- -align array32byte

Benchmarks using both C and C++:
- -xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-prefetch
- -ffinite-math-only -qopt-mem-layout-trans=3

Benchmarks using Fortran, C, and C++:
- -xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-prefetch
- -ffinite-math-only -qopt-mem-layout-trans=3 -nostandard-realloc-lhs
- -align array32byte

---

**Base Other Flags**

C benchmarks:
- -m64 -std=c11

C++ benchmarks:
- -m64

Fortran benchmarks:
- -m64

Benchmarks using both Fortran and C:
- -m64 -std=c11

Benchmarks using both C and C++:
- -m64 -std=c11

(Continued on next page)
Epsylon Sp. z o.o. Sp. Komandytowa
eterio 220 RA1 (Intel Xeon Silver 4114, 2.20 GHz)

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CPU2017 License: 9081
Test Sponsor: Epsylon Sp. z o.o. Sp. Komandytowa
Tested by: Epsylon Sp. z o.o. Sp. Komandytowa

Base Other Flags (Continued)

Benchmarks using Fortran, C, and C++:
-m64 -std=c11

Peak Compiler Invocation

C benchmarks:
icc
C++ benchmarks:
icpc
Fortran benchmarks:
ifort
Benchmarks using both Fortran and C:
ifort icc
Benchmarks using both C and C++:
icpc icc
Benchmarks using Fortran, C, and C++:
icpc icc ifort

Peak Portability Flags

Same as Base Portability Flags

Peak Optimization Flags

C benchmarks:
519.lbm_r -prof-gen(pass 1) -prof-use(pass 2) -ipo -xCORE-AVX512
-03 -no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=3

538.imagick_r -xCORE-AVX512 -ipo -03 -no-prec-div -qopt-prefetch
-ffinite-math-only -qopt-mem-layout-trans=3

544.nab_r: Same as 519.lbm_r

(Continued on next page)
**SPEC CPU2017 Floating Point Rate Result**

Epsylon Sp. z o.o. Sp. Komandytowa

Esterio 220 RA1 (Intel Xeon Silver 4114, 2.20 GHz)

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**CPU2017 License:** 9081

**Test Sponsor:** Epsylon Sp. z o.o. Sp. Komandytowa

**Test Date:** Jan-2019

**Tested by:** Epsylon Sp. z o.o. Sp. Komandytowa

**Hardware Availability:** Sep-2017

**Software Availability:** Mar-2018

---

**Peak Optimization Flags (Continued)**

**C++ benchmarks:**
- `-prof-gen(pass 1) -prof-use(pass 2) -ipo -xCORE-AVX512 -O3`
- `-no-prec-div -qopt-prefetch -ffinite-math-only`
- `-qopt-mem-layout-trans=3`

**Fortran benchmarks:**
- `503.bwaves_r -xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-prefetch`
- `-ffinite-math-only -qopt-mem-layout-trans=3`
- `-nostandard-realloc-lhs -align array32byte`
- `549.fotonik3d_r: Same as 503.bwaves_r`
- `554.roms_r -prof-gen(pass 1) -prof-use(pass 2) -ipo -xCORE-AVX512`
- `-O3 -no-prec-div -qopt-prefetch -ffinite-math-only`
- `-qopt-mem-layout-trans=3 -nostandard-realloc-lhs -align array32byte`

**Benchmarks using both Fortran and C:**
- `-prof-gen(pass 1) -prof-use(pass 2) -ipo -xCORE-AVX512 -O3`
- `-no-prec-div -qopt-prefetch -ffinite-math-only`
- `-qopt-mem-layout-trans=3 -nostandard-realloc-lhs -align array32byte`

**Benchmarks using both C and C++:**
- `-prof-gen(pass 1) -prof-use(pass 2) -ipo -xCORE-AVX512 -O3`
- `-no-prec-div -qopt-prefetch -ffinite-math-only`
- `-qopt-mem-layout-trans=3`

**Benchmarks using Fortran, C, and C++:**
- `-prof-gen(pass 1) -prof-use(pass 2) -ipo -xCORE-AVX512 -O3`
- `-no-prec-div -qopt-prefetch -ffinite-math-only`
- `-qopt-mem-layout-trans=3 -nostandard-realloc-lhs -align array32byte`

---

**Peak Other Flags**

**C benchmarks:**
- `-m64 -std=c11`

**C++ benchmarks:**
- `-m64`

**Fortran benchmarks:**
- `-m64`

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Epsylon Sp. z o.o. Sp. Komandytowa

eterio 220 RA1 (Intel Xeon Silver 4114, 2.20 GHz)

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Peak Other Flags (Continued)

Benchmarks using both Fortran and C:
- -m64 -std=c11

Benchmarks using both C and C++:
- -m64 -std=c11

Benchmarks using Fortran, C, and C++:
- -m64 -std=c11

The flags files that were used to format this result can be browsed at:

You can also download the XML flags sources by saving the following links:

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Tested with SPEC CPU2017 v1.0.2 on 2019-01-30 19:16:34-0500.
Originally published on 2019-02-19.